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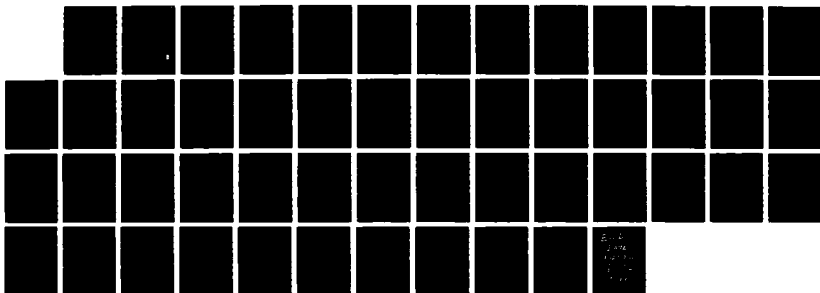
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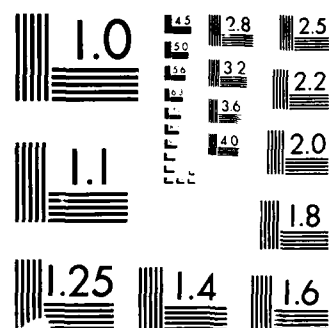
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TIME, SPACE, AND MASS AT THE OPERATIONAL LEVEL OF WAR:
THE DYNAMICS OF THE CULMINATING POINT

by

Major Charles D. Franklin
Armor

School of Advanced Military Studies
U.S. Army Command and General Staff College
Fort Leavenworth, Kansas

28 APRIL 1988

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28 APRIL 1988

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ABSTRACT

TIME, SPACE, AND MASS AT THE OPERATIONAL LEVEL OF WAR: THE DYNAMICS OF THE CULMINATING POINT by MAJ Charles D. Franklin, USA, 44 pages.

This monograph addresses the dynamics of the culminating point and its impact on the modern battlefield. It does so by first establishing a theoretical framework for operational culmination and then examining the theory as reflected in recent history.

This paper focuses on the concept of operational culmination by examining the theoretical elements of culmination and then looking at the application of the concept in actual warfare. To do this, the paper first examines key definitions and provides a theoretical framework for understanding culmination. Next, it considers the application of the concept against the backdrop of actual campaigns in recent history. Then, doctrinal implications are identified in light of theory and experience to assess culmination considerations in U.S. operational doctrine.

The conclusions support the validity of the concept on the modern battlefield. However, although the theory describes a critical dynamic of the battlefield it offers nothing more than a benchmark. It does not offer final answers for the operational artist, but serves as a start point which must be considered in the context of current situations, capabilities, means, and objectives.

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TABLE OF CONTENTS

SECTION I. INTRODUCTION.....	1
Purpose.....	1
The Problem.....	2
Scope.....	3
Methodology.....	4
II. THEORETICAL FRAMEWORK.....	5
Operational Art.....	5
Causes of Culmination.....	9
Elements of Operational Design.....	14
III. APPLICATION OF THE THEORY.....	19
Culmination and the Operational Artist.....	19
Culmination on the Modern Battlefield.....	22
IV. CONCLUSION.....	38
ENDNOTES.....	41
BIBLIOGRAPHY.....	43

SECTION I

INTRODUCTION

An army under modern conditions will rarely be able to accomplish at a single stroke the destruction of the armed forces of a modern nation. Final victory will be achieved only through a succession of operations or phases. Each succeeding phase will generally be dependent on a prior successful operation.(1)

The Principles of Strategy, 1936

A. Purpose

Napoleon called strategy the art of making use of time and space. This is a major element of what we call operational art. According to FM 100-5: Operational art is the employment of military forces to attain strategic goals in a theater of war or theater of operations through the design, organization, and conduct of campaigns and major operations.(2) Its essence is achieving the balance between means, ways, and risk to accomplish desired ends. The linkage of tactical and operational objectives to strategic aims is essential to this balance. However, with the expansion of the depth and lethality of the battlefield single decisive battles are not likely to produce the decisive victories which characterized Napoleon's operations. In fact, if not properly phased, single operations are likely to culminate before accomplishing a decisive end. The most likely consequence of such culmination is failure. Hence, modern campaigns must consider the causes and effects of culmination. A complete appreciation of this phenomena is essential to the effective use of forces in time and space at the operational level of war. This is the focus here--the dynamics of operational culmination.

B. The Problem

According to Clausewitz, culmination is caused by the relative reduction or increase of physical and moral strength of opposing forces during a campaign. He contends that there is a critical point of balance between these forces, when this point is crossed culmination occurs. Beyond this point of culmination, there is a shift of relative strength from attacker to defender. This shift leaves the attacker exhausted in a disadvantageous position. The defender, on the other hand, is now the stronger and able to wrest the initiative by striking against the attacker. This is the moment for which the defender has been waiting and against which the attacker has been racing.

Although the concept of culmination and its impact on operational design is complex, it is key to the planning and conduct of campaigns and major operations. The concept of the culminating point is a major part of Clausewitz's theory of war. He is the intellectual source of the concepts which explain this critical phenomena. Therefore, an understanding of the dynamics of culmination should begin with his explanation.

This monograph looks at the validity of Clausewitz's concept and its utility on the modern battlefield. In doing so it addresses key concerns of operational planning and execution: What are the causes of culmination? What are the effects of culmination? What are the dynamics of culmination in respect to centers of gravity? From these theoretical questions spring a number of current operational concerns: How is culmination incorporated into planning and execution? Is culmination simply a phenomenon which the modern commander must be aware of or is it also an effective tool of operational design? How does the operational level commander prevent premature culmination

and cause the enemy to culminate early? What are the key considerations that operational level commanders and planners must make to incorporate the concept of friendly and enemy culmination into operational planning and execution? A complete appreciation of the nature and application of culmination begins with an understanding of the theory and historical experience. Armed with this appreciation, the operational artist is better equipped to design and execute successful operations.

C. Scope

Operational art comprises numerous elements, each of which are critical to the successful planning and execution of campaigns and major operations. In addition, the application of operational art throughout the spectrum of conflict and in different forms of warfare assumes different considerations. Therefore, to set the focus essential to a comprehensive look at the dynamics of operational culmination the scope of this monograph must be clearly defined.

Five specific parameters define the scope of this paper. First, it concentrates on the operational level of war. Although strategic culmination is a critical component of warfighting it is beyond the purview of this study. Second, this paper focuses on the causes and effects of culmination and does not provide a detailed account of other key aspects of operational art such as centers of gravity and decisive points, except as they relate to culmination. Third, this paper concentrates primarily on mid- to high-intensity warfare on a conventional battlefield. While culmination is of major importance throughout the spectrum of conflict, in both conventional and unconventional war, its application may be considerable different in low-intensity conflicts. While a significant issue, it is not addressed here. Fourth, this paper concentrates

on interstate warfare. The effects of culmination in intra-state warfare are certainly critical elements which must also be examined in depth. Just as the characteristics of intra-state warfare differ from those of interstate warfare, the considerations of culmination are also different. This monograph concentrates on interstate warfare to provide a start point in understanding the effects of operational culmination on the modern battlefield. Finally, in light of theory and actual experience, the consideration of culmination in current and emerging doctrine is assessed. FM 100-5 and AirLandBattle Future Operational Concept (draft) provide the source of doctrine considered in this paper.

D. Methodology

This paper focuses on the concept of operational culmination by examining the theoretical elements of culmination and then looking at the application of the concept in actual warfare. To do this, the paper first examines key definitions and provides a theoretical framework for understanding culmination. Next, it considers the application of the concept against the backdrop of actual campaigns in recent history. Then, doctrinal implications are identified in light of theory and experience to assess culmination considerations in U.S. operational doctrine.

SECTION II

THEORETICAL FRAMEWORK

There are strategic attacks that have led directly to peace, but these are the minority. Most of them only lead up to the point where their remaining strength is just enough to maintain a defense and wait for peace. Beyond that point the scales turn and the reaction follows with a force that is usually much stronger than that of the original attack. That is what is meant by the culminating point of the attack.(3)

A. Operational Art

The theory of operational culmination is derived from the dynamic interaction of space, time, and mass within what Clausewitz calls the climate of war--danger, physical exertion, uncertainty, and chance. It is a fundamental part of Clausewitz's theory of war. To appreciate the dynamics of culmination three major aspects of operational art must be understood: the linkage of strategic and operational aims, the concept of center of gravity, and the identification of decisive points on the battlefield.

Linkage of Strategic and Operational Aims

Clausewitz reminds us that war is armed conflict between political states. It is the continuation of policy through other means--combat. It secures the political objectives of one state by imposing its will on another. During war the desired political end state is given substance in the form of strategic aims. These aims provide the ends toward which the operational commander plans, organizes, and directs campaigns. Thus operational aims must be clearly defined in terms of the contribution they make toward the strategic aim. All operations will then be directed toward objectives which achieve these operational aims which in turn secure strategic objectives for which the campaign is fought.

Center of Gravity

Clausewitz asserts that, in war, the achievement of the strategic aim is best secured through the defeat of the enemy force. By that he means the elimination of their ability to fight--whether it be through actual physical destruction of the force or through moral or cybernetic destruction of the enemy. The concept of center of gravity is a fundamental tool that the operational commander uses in designing operations which achieve this destruction and secure strategic ends.

The center of gravity is "the hub of all power and movement, on which everything depends."⁽⁴⁾ Clausewitz contends that all energy on the battlefield should be expended against this point. As the source of power, the identification and attack of center(s) of gravity are key to defeating the opposing army. Likewise, knowing and protecting your own center(s) of gravity are essential to survival of the friendly forces. According to Clausewitz the first task in "planning for a war is to identify the enemy's centers of gravity," the second task, he says is to concentrate the force against those centers of gravity. Furthermore, at the operational level the center of gravity is found in the greatest concentration of mass.

However, identification of the center of gravity is not enough. It must be attacked either directly or indirectly. Especially for a force with limited means, the indirect approach to the center of gravity is preferred. It is less costly and more certain of success by directing strength against weakness. Since the operational center of gravity is usually the greatest concentration of combat force, a direct attack on a center of gravity pits the greatest concentration of one force against that of another. Like a head-on collision

the force with the greater moral and physical cohesion will emerge dominant--all other things being equal. The indirect approach, however, avoids this collision of main forces. It concentrates superior force at a point and time which threatens or diminishes the center of gravity without attacking it directly. The indirect approach offers opportunities to concentrate superior force faster than the enemy is able to react.

Two factors are critical in this approach. First, the use of time is vital to success. This is particularly true if forces are overall equal and especially so when forces are unevenly matched in overall strength. The second factor is space. The operational artist must consider not only distance but also the impact of terrain in the use of time and the design of ways to concentrate and employ the force. Both Jomini and Clausewitz consider the concentration of superior force at these decisive points major elements of operational art.

Decisive Points.

Whether or not the center of gravity is directly or indirectly assailable, the seizure of certain points provide direct or indirect access. Jomini described these points as terrain or a portion of the enemy force the destruction or possession of which helps to secure victory.(5) Although, Clausewitz does not define the decisive point he uses the concept as a major aspect of his theory of war. In his words, " ... forces available must be employed with such skill that even in the absence of absolute superiority, relative superiority is attained at the decisive point."(6) He goes on to stress the importance of identifying these decisive points in planning to provide the focus for operational execution: "relative superiority, that is,

the skillful concentration of superior strength at the decisive point, is much more frequently based on the correct appraisal of this decisive point, on suitable planning from the start ... and on the resolution needed to sacrifice nonessentials for the sake of essentials...."(7) Thus, the decisive point offers a way to the center of gravity. Lines of communication, supply bases, or key terrain for example, are not necessarily of themselves centers of gravity, but may be decisive points offering assailable objectives against an otherwise unassailable center of gravity.

From the linkage of operational aims with desired strategic end-states, the identification of friendly and enemy centers of gravity, and the design of operations to exploit decisive points springs the fundamental operational decision, how to use the means available to accomplish operational objectives. When and where to defend or attack--when to yield the initiative to the enemy and how to wrest it from him become major elements of operational design. Inherent in each of these decisions is consideration of the culminating point. The operational artist must not only direct his forces against decisive points faster than the enemy can react, but he must do so before his own forces become exhausted. Thus, the causes of culmination are instrumental in shaping the planning and execution of operations.

B. Causes of Culmination

As a war unfolds, armies are constantly faced with some factors that increase their strength and with others that reduce it. The question therefore is one of superiority. Every reduction in strength on one side can be considered as an increase on the other. It follows that this two-way process is to be found in attack as well as in defense.(8)

Clausewitz discusses three inherent characteristics of warfare which provide the theoretical framework for the culminating point. These factors are the presence of friction, the obscuration of reality commonly called the "fog of war," and the superiority of the defense. Each factor contributes to culmination in itself, while the combination of these factors further intensifies the dynamic of culmination. An understanding of culmination begins with an appreciation of these factors.

Friction in War

Friction distinguishes planning from execution--it causes the difference between potential and reality. Clausewitz's concept of friction is composed of the infinite unforeseen things, large and small, which interfere with all activities. It is the primary force which prompts Clausewitz to observe, "Everything in war is very simple, but the simplest thing is difficult."(9) It is an early manifestation of Murphy's Law, reducing the efficiency of the fighting force and continuously wearing down its capabilities.

Clausewitz relates friction to a resistant element through which all activities in war must be conducted. This resistant element continually saps the fighting strength of any force. But, it is intensified when a force must move against a defending enemy to achieve a positive aim.

Clausewitz compares physical friction in war to the friction that reduces the efficiency of a machine. However, warfare is conducted by people, who compound the effects of natural friction through their individual perceptions, actions, and decisions. Chance further intensifies friction. "No other human activity is so continuously or universally bound up with chance."⁽¹⁰⁾ Furthermore, other unpredictable elements such as weather, coincidences, and human error also add to friction.

Fog in War

War is the realm of uncertainty; three quarters of the factors on which action in war is based are wrapped in a fog of greater or lesser uncertainty.⁽¹¹⁾

Uncertainty combines with friction to create ambiguity. Clausewitz identifies the "difficulty of accurate recognition" as one of the most significant causes of friction. When combined with the unreliability of information and a lack of complete knowledge of either enemy or friendly forces, the commander must make key operational decisions in somewhat of a fog. This fog of war presents opportunities for surprise and deception to improve relative combat strength, but it also increases the chances of making incorrect decisions. Therefore, any decision entails a degree of risk. Uncertainty that the situation is seen accurately and that the desired effects will result from planned operations embody the element of risk the commander must accept.

This element of risk induced by fog is in itself a major cause of culmination. The necessity to make decisions based on imperfect or incomplete information reduces the efficiency with which the force is able to conduct operations. The fog of war is an element which causes commanders to be overly

cautious in planning and conducting operations. It influences others to assume risks that they do not truly appreciate--and thus to drive on beyond their culmination point. Because of uncertainty and the myriad of individual factors which exhaust the force, the commander must base many decisions on estimates and anticipation of expected effects. Thus, the fog of war is a major cause of forces crossing over the point of culmination. Fog makes it difficult to distinguish when the point is approaching and when it has in fact been crossed. Deception and inaccurate intelligence only make this harder. In Clausewitz's words:

Once the mind is set on a certain course toward its goal, or once it has turned back toward a refuge, it may easily happen that arguments which would compel one man to stop, and justify another in acting, will not easily be fully appreciated. Meanwhile the action continues, and in the sweep on motion one crosses the threshold of equilibrium, the line of culmination, without knowing it. It is even possible that the attacker, reinforced by the psychological forces peculiar to attack, will in spite of his exhaustion find it less difficult to go on than to stop--like a horse pulling a load uphill. We believe that this demonstrates without inconsistency how an attacker can overshoot the point at which, if he stopped and assumed the defense, there would still be a chance of success.(12)

Superiority of the Defense

What is the object of defense? Preservation. It is easier to hold ground than take it. It follows that defense is easier than attack, assuming both sides have equal means. Just what is it that makes preservation and protection so much easier? It is the fact that time which is allowed to pass unused accumulates to the credit of the defender. He reaps where he did not sow. Any omission of attack—whether from bad judgment, fear or indolence—accrues to the defenders' benefit. ... It is a benefit rooted in the concept and object of defense: it is in the nature of all defensive action. (13)

The tension between the defense and offense is the source of strength in the defense. The defender has the advantages of both terrain and time. Thus, an attacker has to expend greater resources to advance and defeat the defender, than the defender must use to ward off and to exhaust the attacker. It is this resultant change in relative strength which makes the defense the stronger form of war. The defender must simply present a resistant force while the attacker must not only overcome the defending force, but also the effects of friction. Yet, as Clausewitz says, "the defensive form of war is not a simple shield, but a shield made up of well-directed blows." (14) So, the attacker must defeat the defending force while moving through a resistant element, but is also attrited by the blows of the defender.

Therefore, in the defense an otherwise inferior force is able to use time either to grow in absolute strength or to cause the attacking force to diminish in strength until a point of equilibrium is reached. Herein lies the primary reason for the superiority of the defense: the defender accrues the advantage of passing time by delaying the decision. For instance, the defender is able to fall back on established lines of communication while the attacker moves increasingly farther from his base of operations. Thus, the defender grows

relatively stronger as he falls back, while the effects of the defending force and of friction reduce the relative strength of the attacker.

Because of the inherent strength of the defense the attacker must have superior relative strength to overcome the advantages which accrue to the defender. The defender is able to conduct engagements with less strength and also grows relatively stronger over time. Therefore, the attacker must achieve objectives before the advantages of time shift the balance of strength in favor of the defender. For example, the attacker must not only overcome the effects of friction and fog, but he must also move against an enemy who is able to use terrain, striking after the attacking force has exposed itself. The attacker then must move with greater strength and urgency than the defender who gains relative strength with the passage of time.

This relative reduction of the attacker's strength over time and space is the fundamental cause of offensive culmination. More specifically, Clausewitz refers to five major factors which lead to the diminishing strength of an attacking force. First, the attacker's strength is diminished by the need to handle bypassed forces and strongpoints. Second, the attacker is extending his lines of communications while the defender is falling back on his own. Third, the conditions of operating in hostile territory create additional difficulties which weaken the attacker's strength. Fourth, the increasing threat to the defending force may cause allies to intervene, increasing the strength of the defender. Finally, Clausewitz points out that the defender's efforts increase as danger of his defeat increases while the lessening threat to the attacker causes his efforts to slacken.

Although Clausewitz defines culmination primarily in offensive terms it is a critical component of defensive operations as well. The superiority of the

defense is based on four general factors: the benefit of terrain, operations that fall back on an established theater rather than constantly extended, the support of the population, and the advantage of being on the waiting side.(15) However, when the defending force no longer gains advantage from the passage of time it has reached its defensive culmination point. Clausewitz describes this occurrence as the point at which the commander must take other action:

So long as the defender's strength increases every day while the attacker's diminishes, the absence of a decision is in the former's best interest; but if only because the effects of the general losses to which the defender has continually exposed himself are finally catching up with him, the point of culmination will necessarily be reached when the defender must make up his mind and act, when the advantages of waiting have been completely exhausted." (16)

C. Elements of Operational Design: Space, Time, and Mass

"...strategy decides the time when, the place where, and the forces with which the engagement is fought" (17)

Space, time, and mass, are basic considerations of operational design. Their interaction with the characteristics of war just discussed--friction, fog, and the superiority of the defense can either intensify or diminish the effects of culmination.

Clausewitz considered time and space as fundamental to all considerations of war, but emphasized that it is the dynamics of their interaction and the commander's ability to use those dynamics which are critical: "...although the equation of time and space does underlie everything else, and is, so to speak, the daily bread of strategy, it is neither the most difficult nor the decisive factor."(18) It is the combination of superior concentration of mass at the right time and place which provides the decisive factor.

Space

The relationship (between warfare and terrain), to begin with is a permanent factor (his emphasis)--so much so that one cannot conceive of a regular army operating except in a definite space. Second, its importance is decisive in the highest degree (his emphasis), for it affects the operations of all forces, and at times entirely alters them. Third, its influence may be felt in the very smallest feature of the ground, but can also dominate enormous areas.

In these ways the relationship between warfare and terrain determines the peculiar character of military action. (19)

Space is much more than just distance. To put it in the proper perspective, space must also be considered as terrain. In fact, throughout his theory of war, Clausewitz emphasizes terrain as a dominant condition imposed by space on the battlefield. The movement of forces cannot be based on straightforward computations of time and distance, but must consider the unique conditions of the terrain over which they must move. In addition, the nature of that terrain may change drastically in various conditions. For instance, the nature of the terrain in Burma severely hinders the movement of an army in any condition, but becomes virtually impassable during the monsoon season.

Thus, space poses a major challenge, shaping plans and execution in both defense and offense. It can be a significant benefit or a major obstacle to the conduct of operations. For example, it normally offers the defender an edge which is a fundamental reason for the superiority of the defense. The defender is able to incorporate terrain in attriting the enemy, while the attacker must overcome both the opposing force and the terrain. Clausewitz presents speed and relentless activity as ways to the attacker is able to overcome terrain; however, rapid movement creates other effects degrades the force through exhaustion and increased tempo. The nature of terrain and distance are a principal element of tempo.

To those who would dismiss the effects of space on movement Clausewitz says:

None of this is meant to say that there should be any less activity in warfare. Tools are there to be used, and use will naturally wear them out. Our only aim is clarity and order; we are opposed to bombastic theories that hold that the most overwhelming surprise, the fastest movement or the most restless activity cost nothing; that they are rich mines which lie unused because of the general indolence. The final product may indeed be compared to that of gold and silver mines: one looks only at the end result and forgets to ask about the cost of the labor that went into it. (20)

Time

Time is another major factor of culmination. Like space, time is a common consideration driving the operations of both defense and offense. In fact, it is the one dynamic of warfare that is equally shared by all forces. The same minutes pass for both sides: "Both belligerents need time; the question is only which of the two can expect to derive special advantages from it in the light of his own situation." (21) The discriminator is how equal time is used by each force, the failure to use available time is unforgiving, once passed time cannot be restored. Napoleon said, strategy was the art of making use of time and space. Space he could recover, lost time never. (22)

Although time is shared equally by both adversaries it favors the defender. This is a primary factor that makes defense the stronger form of war. It is the different perspectives of time in relation to defensive and offensive forces which influence the nature of operations required to accomplish objectives. The defender seeks to delay the decision and use time to increase relative advantage while the attacker must move to hasten the decision since the passage of time accrues to the benefit of the defender.

This contrasting approach to time produces a tension between defense and offense which is a major characteristic of war.

Mass

Mass, or more specifically the concentration of mass at the right time and place, is the final factor which creates the conditions for culmination. However, superiority is not an end of itself. In fact, it is not numerical superiority itself which is essential for success, but rather the application of superior combat power at the decisive place and time. This statement reflects the basic interaction of time, space, and mass which is a critical foundation of operational art. It is not simply overall numerical superiority which leads to victory. On the contrary, Clausewitz contends that: the causes of culmination intensify over time and space. These factors interact on the attacking force to bring it eventually to a point of culmination.

The attack not only loses strength through attrition in combat--forces inherently lose strength over time and space through exhaustion and deprivation. Friction gradually reduces the effectiveness of mass and the ability to concentrate mass at the decisive point. In addition, fog reduces the potential of mass by causing uncertainty as to where and when mass should be concentrated.

Therefore, culmination results through forces continuously acting on the mass of an army over space and time. The causes of culmination spring from the environment of warfare itself and through the interaction of combatant armies. Although these forces act on both belligerents their effects are most pronounced on the attacking side. Culmination is the product of friction, fog,

and the superiority of the defense. It is the result of both the environmental aspects of war--friction, fog, and the superiority of the defense--and the interaction of opposing forces--space, mass, and time. Although the moral dominance of the attacker and diminishing resources offset these causes to some degree, their effects produce a point at which the forces are balance; crossing this point results in a shift in which the attacking force is vulnerable to defeat and the defending force no longer accrues additional advantage from the defense. The theoretical framework established in this section lays out the causes and effects which produce operational culmination. But, is culmination simply a dynamic which the commander must consider in analysis or does it provide an effective operational tool for defeating an enemy? To assess both the validity of these theoretical concepts and their utility to the modern operational commander they must be considered in light of actual experience.

SECTION III

APPLICATION OF THE THEORY

A. Culmination and The Operational Artist

Operational art is the employment of military forces to attain strategic goals through the design, planning and execution of campaigns and major operations.(23) An essential consideration underlying operational art includes the use of force over time and space to accomplish desired aims. This consideration requires fundamental decisions of when and where to fight and whether to defend or to delay. The basis of these decisions include the identification of centers of gravity and decisive points. From these considerations the operational artist designs methods to achieve the concentration of sufficient force at the most effective time and place. The concept of the culminating point affects the nature of all of these operational elements. The operational commander must not only be aware of this point in planning and execution but also must take actions to incorporate timely pauses, or extend this point through the generation and sustainment of means and prevent its hastening as a result of enemy actions.

War is conducted against an enemy who also acts and reacts and this further intensifies the complexity of actions. This is further compounded by the elements of chance and uncertainty. Thus, knowing means--generating and sustaining them--creating effective ways and combinations of battles and engagements at the decisive time and place--directed at objectives which threaten the enemy center of gravity--and at a tempo that is relatively greater than the enemy's and makes most out of available time and knowing when and how long to pause before continuing is essential to operational art.

As campaigns are more complex, decisions as to distribution of forces, when and where to maneuver, and timing become increasingly critical. The ability to correct operational mistakes is diminished. However, Clausewitz reminds us of the complexity seemingly simple operations present the commander:

That is why the great majority of generals will prefer to stop well short of their objective rather than risk approaching it too closely, and why those with high courage and an enterprising spirit will often overshoot it and so fail to attain their purpose. Only the man who can achieve great results with limited means has really hit the mark.(24)

Bringing superior strength to bear at the decisive time and place is fundamental to operational art. The awareness of the point of equilibrium between attacker and defender is critical to accomplishing this. The attacker must understand the strength necessary to accomplish the operations in terms of time and space relative to the opposing force. To continue operations past the point of equilibrium would yield the advantage to the defender. The attacking force must then assume the defense but, a defense conducted within the framework of an offense is "weakened in all its key elements (and) will thus no longer possess the superiority which basically belongs to it." (25)

Thus, the attacking commander must either take actions to extend this point or design operations which consider this point and do not cross over it. This produces a major element of operational art: on the offensive knowing when, where, and how to attack (and to stop); and on the defensive knowing how to wrest initiative and when to attack. Prior to approaching the culmination point the effective commander usually implements one or more pauses in his campaign. The well timed operational pause builds strength. For example, the operational pause facilitates the collecting of dispersed forces and

replenishment. Implemented prior to culmination it enables the commander to build from a position of strength relative to the enemy. In effect he picks the time and place to assume the defense to accrue the necessary superiority of strength before continuing with the offensive. Clausewitz continually emphasizes this dynamic nature of the campaign:

Just as no defensive campaign consists simply of defensive elements, so no offensive campaign consists purely of offensive ones. Apart from the short intervals in every campaign during which both sides are on the defensive, every attack which does not lead to peace must necessarily end up as a defense.(26)

The defending commander must also be aware of his culmination point in both design and execution. When the defender no longer gains in relative strength over time he reaches his defensive culminating point--he must act. Accordingly, his operations are conducted not only to hold or trade space for time, but also to drive the offensive to the point at which it must assume the defensive. Actions designed to drive the attacking force to early culmination or the defending commander who recognizes an attack which has past its culmination point should transition to the offensive. For not only does he now possess the relative strength needed to attack, the attacking enemy must now defend without the inherent advantages of the defense. As Clausewitz points out:

One defense is therefore not exactly like another nor will defense always enjoy the same degree of superiority over attack. In particular this will be the case in a defense that follows directly the exhaustion of an offensive--a defense whose theater of operations is located at the apex of an offensive wedge thrust forward deep into hostile territory. Only the first of the four factors listed above, the utilization of terrain, will remain unchanged in such a defense; the second is usually eliminated, the third works in reverse, and the fourth is much reduced in strength.(27)

In terms of culmination then, offensive commanders design and execute the attack to achieve decisive objectives before reaching the culmination point; if not able to do so the operation must be phased to prevent the crossing the impending culmination point. In the defense though, commanders conduct operations to force early culmination of the attack, recognize its advent, and go over to the offense when it arrives.

B. Culmination on the Modern Battlefield

Fools say that they learn by experience. I prefer to profit by other's experience.(28)

Bismarck

This section considers the application of the concept of culmination against the backdrop of an actual operations in modern history. Three operations provide a varied look at the dynamics of culmination on the modern battlefield. An examination of these operations illustrates the nature of the dynamics described by Clausewitz in actual practice and enables us to assess the validity of this Clausewitzian concept in modern war.

Imphal/Kohima

The Japanese strategic aims which brought them into Burma were tied first to the protection of the Japanese Malayan flank from the British in South-West Burma and second to cut the supply line to China along the Burma road. On the other hand, the strategic aims of the British were not as clear. However, two factors were clear. First, the British force within Burma tied up a significant Japanese force. Second, the continued sustainment of the forces in China depended on the lines of communication running through Burma.

Although, the strategic aims of the British were not clearly defined strategic priority was clearly laid out: to maintain lines of communication to China. Slim translated this aim into a single operational aim--the destruction of the Japanese Fifteenth Army. To accomplish this aim, all focus within the Fourteenth Army was in preparation for the main offensive from the Imphal plain. Throughout the final months of 1943 Slim had been steadily building up strength to strike the Japanese a hard blow from the center front. In doing so, Slim presented the Japanese with a clear center of gravity. The operational concentration of British forces obviously existed around Imphal, the key to their defeat lay in destroying this center of gravity.

Both the Japanese and British operations were designed to accomplish these strategic aims. The Imphal-Kohima operation was critical to both sides. The outcome of the operation would determine which force would dominate the region. Yet, Burma was a secondary theater for both forces. Consequently, the drain of resources would affect both sides. The operational skills of the opposing commanders would determine the outcome.

The imminent British offensive was obvious to the Japanese. But, the British were increasing in strength whereas the Japanese had reached the point that other theaters were draining resources over time. The Japanese in Burma had reached their defensive culmination point. Accordingly Mutaguchi, planned to preempt the British offensive by defeating the concentrated British forces and securing the frontier passes before the monsoon broke.

The British, on the other hand, were shifting to a strategic offensive. Slim sought to assume this offensive by temporarily yielding initiative to the enemy, assuming the operational defensive, and drawing the Japanese beyond their offensive culminating point before going on the offensive.

British preparations to regain Burma began with their withdrawal across the Chindwin River. The British established a defensive line and conducted limited offensive actions across the river while building up a base of operations and preparing the force for offensive operations. The British established a defensive line along the Burma-India frontier. They used the advantages of the defensive to rebuild a morally and physically beaten force. They accrued the advantages of time through training, building up the force, establishing a base of operations, and developing new methods of fighting and sustainment.

Thus, the process of operational culmination started before the operation was even began. While the Japanese would race against time to accomplish their operational aim, the British embraced the advantages of time and overcame the shortfall of means through a balance of effective methods and moral strength to overcome the risk of culminating before accomplishing their operational objective.

In February 1942 both sides were poised to strike. Mutaguchi's intention was to preempt the British offensive, achieving surprise and defeating the British forces while they were concentrated around Imphal and positioned to attack rather than defend. Slim, on the other hand, had the flexibility to recognize the opportunity offered by the Japanese attack. Since assuming command of the Fourteenth Army in October Slim had hoped to "entice the enemy into a major battle in circumstances so favorable to us that we could smash three of his four divisions."⁽²⁹⁾ Slim unintentionally created this condition, and had the flexibility to change well established plans when the opportunity was offered. The disposition of the British 4 Corps and its sustainment was well suited to spearhead a major offensive, but not to defend. The three

divisions of 4 Corps were deployed--dispersed in time and space--to offer the Japanese the opportunity to defeat them piecemeal at decisive points.

The deployment of the British Fourteenth Army presented a center of gravity in the concentration of the 4 Corps and its sustainment in the Imphal-Kohima-Dimapur area. Thus, Mutaguchi recognized not only that the Japanese force had reached its defensive culmination point but also that the key to Japanese victory lay in the defeat of the British 4 Corps. He subsequently designed operations to set conditions for the concentration of superior force against the British center of gravity and to defeat the center of gravity.

The Japanese plan was to launch an offensive, 'Operation Ha-Go' in Arakan to draw the Fourteenth Army reserves away from the central front. Following the commitment of the British reserves the main offensive, 'Operation U-Go' was to be launched against the 4 Corps to destroy the British 4 Corps and seize the allied base at Imphal.

Although 'Operation Ha-Go' succeeded in diverting the British operational reserve from the center sector, it also offered Slim's army ample warning of the Japanese intention to attack in the center. 'Operation U-Go' planned to kick off in mid-February, shortly after the operational diversion in Arakan was delayed until 6 March waiting for reinforcements. This delay offered the Fifteenth Army time to interpret the Japanese intentions. Slim used the additional time to switch to the defensive, reinforced the 4 Corps with the 5th Indian Division and constituted an operational reserve from the 7th Indian division.(30)

Slim had the flexibility to adjust planned operations and decided to offer the Japanese the initiative temporarily, exploiting the defense to force the

Japanese army to culminate before reaching its objective and then launching the British offensive to complete the destruction of the Japanese Fifteenth Army. Slim identified the Japanese center of gravity created when Mutaguchi concentrated his force around Imphal. He identified the destruction of this center of gravity. He would accomplish his strategic aims by orienting all operations on the destruction of this center of gravity as the operational objective. Furthermore, he would defeat this force by allowing it to cross its offensive culminating point before taking the offensive.

Three major factors determined the outcome of the operation: the sequencing of battles; the use of time, space, and mass; and, the unique characteristics of the battlefield (fog, friction, and the superiority of the defense). Each factor played a major role in operational culmination which determined the final outcome of the operation.

The effects of these tactical engagements caused significant operational delay and attrition of Japanese forces, pushing them toward premature culmination. These operational engagements occurred at Tiddim, Kabbaw Valley, Imphal, and Kohima. Equally important is a fifth engagement which never occurred. The Japanese failed to recognize the vital nature of Dimapur, probably the most key decisive point against the British. Dimapur was vital to the sustainment of the British force. Not only was it the major supply base it was the most forward railhead supplying both Burma and China.

Four battles--separate yet dependent on each other--were fought at decisive points in the Imphal-Kohima area. The deployment of the British 4 Corps determined the location of the decisive points, while the Japanese operations were designed to concentrate superior force at each one defeating the British forces. The first decisive point was the 17th Indian Division

around Tiddim. The Japanese 33d Division was to cut off and destroy the 17th then continue on to Imphal. The second decisive point was the Kabaw Valley. This point was to be attacked by the 15th Division to contain and isolate the 20th Indian Division and continue the attack to converge with the 33rd Division on Imphal to destroy the 23d Division. Meanwhile, the Japanese 31st Division was to seize Kohima and sever the major Allied line of communication.

In execution, Slim's use of time and space to bring about the culmination of the Japanese force is an illustration of Clausewitz's assertion that the defense is the main cause of loss of offensive strength. The defensive is superior, according to Clausewitz, because of the advantages accrued through the use of time and space. As Scoone's forces fell back on Imphal each major engagement caused tremendous attrition on the Japanese force--not only in terms of casualties but in terms of moral decline.

The use of time by the Allied forces was another significant factor in applying the concept of culmination. The Japanese almost unhinged the British defense through an initial tempo faster than Slim had expected. But, one of the factors of British triumph was the use of air and the sequencing of timely battles at decisive points to achieve a superior tempo a significant element driving the Japanese offense to a premature culmination. Japanese success was tied to maintaining a tempo of attack faster than the British ability to concentrate mass, withdraw, and supply. For example, Mutaguchi was aware from the beginning that his forces were on the edge of sustainment capabilities. Japanese lines of communication were tied to land routes, tremendously extended over extreme jungle terrain virtually devoid of any transportation infrastructure. However, the lessons learned by the British out of defeat produced new methods of supply, command of isolated units, concentration of

force, and intelligence collection. These new methods combined with a British force now trained to fight in the jungle effectively. Consequently, the Allies were able to not only slow the Japanese tempo through well fought defensive battles, but also to increase British tempo to unprecedented rates.

The application of space also played a key role in culmination of the Japanese force. In the offensive the Japanese were continuously extending already over-stretched supply lines, while British forces were falling back on their base of supply. In addition, the British air freed the Allies from the constraints faced by the land-locked Japanese. Consequently, the British were able to reinforce much more rapidly than the Japanese anticipated.

Sustainment problems made culmination a very real concern to both sides. The jungle terrain, extreme weather, and severely limited infrastructure made the movement of supplies over land extremely difficult. The Japanese remained bound to land lines of communication throughout the campaign. They faced the sustainment problem through training--Japanese soldiers could exist on much less support than British soldiers--and on operational design. The British, on the other hand combined leadership and training with new techniques of aerial resupply. This combination freed them from much of the constraints presented by the harsh terrain and prepared the British soldier to adapt to infantry warfare in the jungle.

Slim capitalized on British moral strengths and new techniques to overcome austerity imposed by logistical, force, and terrain constraints. For example, the use of air to sustain, move forces, and to project combat power gave the British an edge not recognized by the Japanese. In addition, Slim recognized the need to fight isolated actions and prepared the soldiers of the Fourteenth Army to do so--physically and morally. He adapted his force by recognizing new

possibilities and translating this recognition through training and sound leadership. Thus, the British used means at their disposal to create unique ways of extending the sustainment of combat power as well as generating combat power. They used air to alter the equation of normal constraints limiting the equation of tempo and operation effectiveness.

The Japanese, however, based their operational design on expectations that the enemy had not changed. This expectation was wrong. Slim had used time to develop a new Army, motivated, disciplined, and adapted to new operational and tactical methods of fighting. The force equation which balanced ends and means had been changed, but the Japanese failed to recognize it. Accordingly, the relative impact of time and space had changed and the Japanese no longer had an accurate appreciation of either the British or their own culmination point. Culmination, then, is relative. As the enemy changes so the estimation of both friendly and enemy culmination points must change also.

Rommel's Second Offensive Gazala to El Alamein

Rommel's second offensive against the British Eighth Army offers another example of the application of culmination on the modern battlefield. Similar to the Imphal/Kohima operation, both sides started with armies subjected to severe logistical constraints. However, in North Africa the nature of forces and the terrain set conditions for a totally different style of warfare. Also unlike Burma, North Africa was a secondary theater for only one adversary--the Germans. For the British it was the main theater of war at the time. Accordingly, it received a priority of support unavailable to German forces.

In January 1942 Rommel's army was squared off against Auchinleck's Eighth Army with both forces in a defensive line at El Agheila. Both sides were taking advantage of an operational pause to prepare their armies for the continuation of an offensive. However, both were operating from greatly extended lines of communication. The British force was 800 miles from its base of operations in Cairo and the Axis force was 450 miles from its base in Tripoli.

Rommel's preparations peaked prior to the British. In addition, he was aware that from this point on the British would continue to gain strength while his force would become relatively weaker. Rommel's force no longer had the advantage of time--the defensive culmination point had been reached--it was time to attack.

On 21 January Rommel attacked on a narrow front rapidly penetrating the British covering force and driving into the British rear. Surprise was achieved. The British force, widely dispersed and not prepared for the attack, withdrew rapidly leaving behind large quantities of fuel and other stores.

Rommel offered this criticism of the British operations:

The principal aim of the British should have been to have brought all the armour they had into action at one and the same time. They should never have allowed themselves to be duped into dividing their forces before the battle or during our feint attack against the Gazala line. The full motorisation of their units would have enabled them to cross the battlefield at great speed to wherever danger threatened. Mobile warfare in the desert has often and rightly been compared with a battle at seas--where it is equally wrong to attack piecemeal and leave half the fleet in port during the battle.(31)

At Gazala the British took advantage of defensible terrain and held fast. In addition, Rommel's attack was reaching the point where it could no longer be

sustained. Accordingly, he paused his operation to replenish combat power to the point where the operation could continue.

Rommel paused at Gazala for four months, building up his force to continue the attack. On 28 May he resumed the offensive. He planned to envelop the British left flank on the open desert, with a concentrated force of Afrika Korps Panzers. Meanwhile, the Italians attacked the Allied center primarily to distract British attention from the main attack sweeping around the British flank. The Italian troops were held at Bir Hacheim by the French, German armored divisions turned the British positions in the south and attacked north, striking the British rear.

By the time the Italian forces succeeded in breaking through the British line between Bir Hacheim and Gazala, Rommel's armored forces were running out of fuel. At this point Rommel demonstrated the value of timely leadership in extending the culminating point. Rommel turned his attention to assuring supplies reached the German tanks. With his armored forces backed up against a British minefield, he personally led, and established a forward base of supply within a British minefield. This unorthodox action provided both the security and central location needed to replenish the mechanized combat power. The German tanks were resupplied from this position and continued the attack deep into the British rear threatening lines of communication of the entire Eighth Army. In addition, British counterattacks failed to concentrate their overall superior armored force and wasted combat power on piecemeal attacks against German strength. Consequently, the British withdrew back to Egypt on 13 June.

Although outnumbered in men, tanks, and aircraft Rommel employed a style of mobile warfare to which the British were unable to adapt. Rommel combined an operational offensive with the strength of tactical defenses to compensate

for his numerically inferior force. This defensive-offensive combination was accomplished through synchronized operations which set conditions enticing the British to direct counterattacks against well planned defensive positions. This technique produced severe attrition of British mechanized forces. Rommel reflected that he took up what appeared to be perilously exposed defensive positions...

on the certain assumption...that the British would not dare to use any major part of their armoured formations to attack the Italians in the Gazala line (while strong German panzer forces stood in a position to threaten their rear).....Thus I foresaw that the British mechanised brigades would continue to run their heads against our well-organised defensive front, and use up their strength in the process.(32)

Thus Rommel was able to design methods which incorporated the superiority of the defensive within the context of the offensive. He was thereby able to turn the tables of culmination against the defender by using the dynamics of defensive operations to attrit the enemy force.

As the British withdrew, Tobruk fell to a synchronized ground and air attack by the Afrika Korps. Rommel relentlessly pursued the battered British Eighth Army into Egypt. Attempting to defeat the British force before it could reach the next defensible terrain at El Alamein. He was unable to do so. Thus, the British Eighth Army occupied strong defensive positions along the Alam Halfa ridge, between the impassable Qattara Depression and El Alamein. The gap between the coast and the Qattara Depression at this point was only 40 miles. The terrain now favored the style of warfare for which the British were more accustomed. The war of maneuver which Rommel executed so well was severely constrained by the obstacles formed by the coast on the north and the Qattara Depression on the south. Rommel now had to fight directly through

British positions to defeat them. In addition, the British were only 60 miles from Alexandria. The relatively short line of communication not only made sustainment more effective, but also put Axis forces within the range of British air power, while German air could not reach this far. Rommel's supply lines were over-extended and he was beyond the reach of effective air support.

From the strength of defensive positions, the British launched concentrated counterattacks against the Italian forces--the Axis weakness--and continuously directed air power against the German tanks making maneuver virtually impossible. At the same time, allied increasing naval and air strength in the Mediterranean further worsened Rommel's logistical situation. The Axis force had crossed its culminating point setting the conditions for Montgomery's counter-offensive in September.

As in Burma, the North African environment drove operational design; but, in different ways. In Burma, the terrain produced an infantry war of position focused on clearly defined decisive points at key geographical positions--Tiddim, Kabaw Valley, Imphal, and Kohima. Infantry forces required much less sustainment than the mechanized forces in North Africa--resupply by air could satisfy logistical requirements. Only attrition of soldiers could bring about defeat of forces. Isolated forces could continue to fight indefinitely and significantly affected enemy operational tempo.

In contrast, the North African terrain presented totally different considerations. The dynamics of culmination operated in a different manner to produce the effect of culmination. Here, warfare between mechanized forces encompassed great distances and a high operational tempo. Stationary forces were quickly by-passed. Forces cut off from their lines of communication quickly felt the impact as fuel ran dry and large caliber ammunition was

rapidly expended. Unlike Imphal-Kohima cutting lines of communication sustainment soon made forces ineffective. In the infantry warfare of Burma the same dynamics were present but produced different effects. For example, the effects of cutting land lines of communication did not immediately impact on the combat power of a force. In addition, operational tempo was greatly reduced, although still a significant factor as relative operational tempo was key to gaining superior combat power at the decisive time and place. In addition to achieving superior combat power, achieving a higher operational tempo than the enemy was also key in extending the culmination point. Maneuver warfare created the effect of additional means for Rommel, and the use of air power to resupply, reinforce, and apply force did the same for Slim.

However, the desert environment presented equally harsh conditions as the jungle. Like Slim, Rommel recognized the importance of training, discipline, and confidence in building confidence and morale. The attainment of moral dominance was considered by both leaders as a significant force which enabled the respective armies to accomplish objective which seemingly require more resources than are available.

Rommel also recognized and implemented a new style of fighting while the British were less adaptable. This style plus leadership enabled Rommel to extend his culmination point in a seemingly desperate situation and establish a tempo which extremely accelerated British operational tempo.

Finally, as in Burma it was the superiority of the defense and disregard of logistical constraints which finally drove the Germans past their point of culmination at El Alamein. The British falling back on their shortening lines of supply were able to sustain and direct air power against the Germans while the failure to secure Malta made Rommel's lines of communication extremely

extended and put his operations out of reach of German air power. Also, the British learning from previous mistakes concentrating synchronized counterattacks against German weakness rather than squandering forces in widespread counterattacks against German strength. However, Rommel was able to incorporate the tactical defensive within the construct of an operational offensive to use the dynamics of culmination at Gazala--forcing an otherwise superior force to culminate rapidly even though on the defensive.

However, Slim's operations were the product of planning intentionally designed to extend friendly sustainment and cause early enemy culmination. In North Africa, Rommel himself finally set the conditions for the strategic culmination of his force primarily through the failure to design operations consistent with the means at hand--overconfidence in German abilities and under-estimation of British operational abilities.

The German culmination at El Alamein set the conditions for Montgomery's offensive two months later, after taking advantage of the superiority of the defense and shortened supply lines to methodically build up strength and prepare for the inevitable offensive. The Germans were not only unable to attack effectively, but were unable to defend any of the gains they had acquired. The conditions for the strategic turning point in North Africa were set.

Inchon Landing

The operations just discussed both show different aspects of the dynamics of culmination on the modern battlefield. However, both illustrate the use of defensive operations to hasten the culmination of an enemy force. A brief look at the Inchon landing during the Korean War provides a different perspective.

It shows the use of culmination as an operational tool in the design of offensive operations. Rather than relying on the superiority of the defense to eventually erode enemy forces to the point of culmination, the Inchon landing brought about the rapid culmination of an enemy force through a concentrated attack deep in the enemy rear. The Inchon landing demonstrates the effect of the indirect approach against a decisive point to cause the moral and physical culmination of an otherwise strong force.

On 25 June, 1950 the North Korean forces attacked across the border with seven infantry divisions and a tank brigade, rapidly driving the Republic of Korea (ROK) Army into the southern peninsula. The U.S. intervention on 30 June, eventually slowed the offensive until a final defensive position was established around Pusan. From 5 August to 15 September, Eighth Army forces maintained a perimeter around Pusan and fought a defensive battle against North Korean forces which had increased to 14 infantry divisions.

On 15 September MacArthur launched the Inchon invasion. Inchon was a decisive point in the Korean campaign. The unexpected landing of the X Corps at Inchon threatened the North Korean Army concentrated in the south around Pusan. The X Corps not only cut the North Korean lines of communication but set the conditions for the rapid culmination of the North Korean force as they now had to fight a strong force in two directions. Synchronized with the Inchon landing the Eighth Army launched an offensive to break out of the Pusan perimeter. Initially the force met with staunch opposition, but within two days the physical and moral effects of the Inchon landing caused the rapid disintegration of the North Korean Army. Opposition rapidly diminished and by 26 September the lead divisions of the Eighth Army had linked up with the X Corps at Seoul.

MacArthur's vision of the effects of the Inchon Landing focused on the immediate impact this operation would have--bringing the enemy force unexpected and suddenly beyond their culminating point. His comments during planning of the operation reflect this critical aspect of the design of Operation Chromite:

...seizure of Inchon and Seoul will cut the enemy's supply line and seal off the entire southern peninsula. The vulnerability of the enemy is his supply position....The several major lines of enemy supply from the north converge on Seoul....By seizing Seoul I would completely paralyze the enemy's supply system--coming and going. This in turn will paralyze the fighting power of the troops that now face Walker....(33)

This operation demonstrates the potentially rapid effect the indirect approach can have on a strong enemy force. The defensive battle around Pusan set the conditions for the success of the Inchon operation. The North Korean Army sensing imminent victory was concentrated against the remaining forces around Pusan. In effect the Pusan perimeter acted as an anvil creating a North Korean center of gravity in the concentration of the North Korean Army. The landing of the X Corp in the North, then, not only cut the lines of supply, but also trapped the enemy center of gravity between two major forces.

MacArthur recognized Inchon and Pusan as decisive points. The seizure of these points would unhinge the North Korean center of gravity created in the south with the concentration of the North Korean Army against the Pusan perimeter. In effect, Operation Chromite was an indirect attack on the North Korean center of gravity. Its successful execution caused a dramatic increase in the rate of moral and physical culmination of the enemy force.

This section has considered the application of the theoretical concepts of the culminating point developed in the first section. Clausewitz's concept of culmination is a critical dynamic present on the modern battlefield. But more

than that, it provides a tool for the design and execution of campaigns. In planning, both friendly and enemy culmination points are instrumental in the design and organization of operations in time and space. In execution, the relative and dynamic nature of culmination becomes apparent. The operational commander must take not only actions to overcome the effects of fog and friction, but must also consider the effects of enemy actions on his operational culminating point. Likewise, he is also able to design operations to exploit enemy operational culmination, causing the enemy force to culminate early. In summary, although the dynamics of culmination are complicated they play a critical role in operational art.

SECTION IV: CONCLUSION

Theory offers clearer insight of cause and effect relationships necessary to attain a linkage of means to ends. Considered both in the context in which it was written and in the context of historical experience, theory becomes a powerful tool for the commander. Theory offers insight into the dynamics of war while experience provides an appreciation of their application on the actual battlefield. However the application of theory must be considered in the light of actual experience. Clausewitz expresses the benefits of theory this way:

The insights gained and garnered by the mind in its wanderings among basic concepts are benefits that theory can provide. Theory cannot equip the mind with formulas for solving problems, nor can it mark the narrow path on which the sole solution is supposed to lie by planting a hedge of principles on either side. But it can give the mind insight into the great mass of phenomena and of their relationships, then leave it free to rise into the higher realms of action.(34)

Clausewitz's concept of the culminating point describes just one of the key dynamics of war. His concept relates a critical phenomenon resulting from the application of force over time and space. It is a vital consideration in the linkage of means to ends through the design and execution of operations. Theory suggests that the linkage of means to ends must be achieved by maintaining superiority of combat power and will until the end is achieved. However, the factors of time and space within the environment of the battlefield act to diminish both combat power and will. If the commander cannot achieve his objective prior to culmination he faces the prospects of a losing battle of attrition or swift defeat at the hands of a capable enemy.

Thus, the increasing complexity, lethality, depth, and operational tempo since Clausewitz's time require that the concept be interpreted in the context

of modern warfare. Historical experience indicates that effective commanders recognize both the consequences and the possibilities afforded by culmination. Consideration of the consequences enables commanders to design operations which are phased and directed to accomplish objectives before culmination occurs, or to expand existing capabilities through operational design. Consideration of possibilities offered by the dynamics of culmination enables the commander to design and execute operations to cause early culmination of the enemy force as a condition for tactical success.

In application, the theoretical culmination point is the product of the relative increasing and diminishing combat power of opposing forces over time and space. Relative strength changes over space and time through the effects of both the battlefield environment and of friendly and enemy actions. Accordingly, the commanders estimate of the culmination point must also change to correspond to the dynamic nature of constantly changing combat power relationships.

The doctrinal implications of the culminating point are clear. Although the concept of culmination and its impact on operational design is complex, it is key to the planning and conduct of campaigns and major operations. The failure to consider both enemy and friendly culminating points in operational design, organization, and execution can be fatal. Current doctrine recognizes this importance; yet, it does not reflect the complexity of the dynamics of culmination and its relationship to the balance of operational means, ways, and risk to accomplish strategic ends. Accordingly, as operational doctrine continues to evolve greater emphasis must be placed on this dynamic. It needs to be considered in detail not only in doctrine, but also in training, force development, and materiel development.

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